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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/976,931	10/11/2001	Clifford L. Hersh	PA1951US	2047
22830	7590	03/22/2005	EXAMINER	
CARR & FERRELL LLP 2200 GENG ROAD PALO ALTO, CA 94303			ALI, SYED J	
			ART UNIT	PAPER NUMBER
			2195	

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/976,931

Applicant(s)

HERSH, CLIFFORD L.

Examiner

Syed J Ali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2001.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-18 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 11 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. Claims 1-18 are pending in this application.

#### ***Specification***

2. The cross reference related to the application cited in the specification must be updated (i.e. update the relevant status, with PTO serial numbers or patent numbers where appropriate, on page 1, paragraph 0001). The entire specification should be so revised.

#### ***Double Patenting***

3. Applicant is advised that should claims 1-3 be found allowable, claims 5-7 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Larsen et al. (“B-Trees With Relaxed Balance”) (hereinafter Larsen).**

6. As per claim 1, Larsen teaches the invention as claimed, including a method of reducing the number of times a tree data structure is rebalanced (§1) comprising the steps of:

- (a) allowing a sub-tree of the data tree structure to grow unbalanced to a threshold level greater than one (§§1, 3); and
- (b) rebalancing the data tree structure when the threshold level is reached (§4).

7. As per claim 2, Larsen teaches the invention as claimed, including the method of claim 1 wherein the threshold level is  $\log_2 n$  for a tree data structure having about  $n$  nodes (§§3, 5).

8. As per claim 3, Larsen teaches the invention as claimed, including the method of claim 1 wherein the threshold level is a constant number of levels greater than a level of a balanced portion of the tree data structure (§§3, 5).

9. As per claim 4, Larsen teaches the invention as claimed, including the method of claim 1 wherein the step of rebalancing the tree data structure further comprises:

- (a) developing first and second sets of rebalancing operation tasks, the first set of operation tasks operable to effect a first set of element state transitions and the second set of operation tasks operable to effect a second set of element state transitions, the first and second set of element state transition being distinct one from the other (§4, “Split” and “Compress”);
- (b) performing the first set of operation tasks in a first phase (§5); and

- (c) performing the second set of operation tasks in a second phase (§5).

10. As per claim 5, Larsen teaches the invention as claimed, including a method of deferring the rebalancing of a tree data structure comprising the steps of:

- (a) allowing a sub-tree of the tree data structure to grow unbalanced to a length greater than one (§§1, 3); and
- (b) rebalancing the tree data structure when the length of the sub-tree reaches a threshold reached (§4).

11. As per claim 6, Larsen teaches the invention as claimed, including the method of claim 5 wherein the threshold level is  $\log_2 n$  for a tree data structure having about  $n$  nodes (§§3, 5).

12. As per claim 7, Larsen teaches the invention as claimed, including the method of claim 5 wherein the threshold level is a constant number of levels greater than a level of a balanced portion of the tree data structure (§§3, 5).

13. As per claim 8, Larsen teaches the invention as claimed, including a method of deferring the rebalancing of a tree data structure (§1) comprising the steps of:

- (a) tracking the performance of operations upon the tree data structure (§§1, 3); and
- (b) rebalancing the tree data structure when an unbalanced sub-tree of the tree data structure reaches a threshold level greater than one (§4).

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14. As per claim 9, Larsen teaches the invention as claimed, including the method of claim 8 wherein the threshold level is  $\log_2 n$  for a tree data structure having about  $n$  nodes (§§3, 5).

15. As per claim 10, Larsen teaches the invention as claimed, including a method of performing a rebalancing operation upon a tree data structure comprising the steps of:

- (a) allowing a sub-tree of the data tree structure to grow unbalanced to a threshold level greater than one (§§1, 3);
- (b) developing, in the case where a sub-tree reaches the threshold level (§4), first and second sets of rebalancing operation tasks, the first and second set of rebalancing operation tasks operable to effect a first and second set of element state transitions respectively (§4, “Split” and “Compress”);
- (c) performing the first set of operation tasks in a first phase (§5); and
- (d) performing the second set of operation tasks in a second phase (§5).

16. As per claim 11, Larsen teaches the invention as claimed, including the method of claim 8 wherein the threshold level is  $\log_2 n$  for a tree data structure having about  $n$  nodes (§§3, 5).

17. As per claim 12, Larsen teaches the invention as claimed, including a process for maintaining the balance of a tree data structure (§1) comprising:

- (a) monitoring a length of a sub-tree of the tree data structure (§§1, 3); and
- (b) rebalancing the tree data structure when the length of the sub-tree reaches a level greater than one (§4).

18. As per claim 13, Larsen teaches the invention as claimed, including a system for deferring the rebalancing of a tree data structure (§1) comprising:

- (a) a memory for storing the tree data structure (Abstract; §7) and
- (b) a processor coupled to the memory (§1), the processor operable to track the performance of operations upon the tree data structure and rebalance the tree data structure when an unbalanced sub-tree of the tree data structure reaches a threshold level greater than one (§§1, 3).

19. As per claim 14, Larsen teaches the invention as claimed, including the system of claim 13 wherein the threshold level is  $\log_2 n$  for a tree data structure having about  $n$  nodes (§§3, 5).

20. As per claim 15, Larsen teaches the invention as claimed, including a system for deferring the rebalancing of a tree data structure (§1) comprising:

- (a) means for storing the tree data structure (Abstract; §7); and
- (b) a means for tracking the performance of operations upon the tree data structure (§§1, 3) and rebalancing the tree data structure when an unbalanced sub-tree of the tree data structure reaches a threshold level greater than one (§4).

21. As per claim 16, Larsen teaches the invention as claimed, including a computer readable medium for deferring the rebalancing a tree data structure (§1), the computer readable medium comprising:

- (a) a code segment for tracking the performance of operations upon the tree data structure (§§1, 3); and
- (b) a code segment for rebalancing the tree data structure when an unbalanced sub-tree of the tree data structure reaches a threshold level greater than one (§4).

22. As per claim 17, Larsen teaches the invention as claimed, including a method of deferring the rebalancing of a tree data structure (§1) comprising the steps of:

- (a) tracking the performance of operations upon the tree data structure (§§1, 3); and
- (b) rebalancing the tree data structure when an unbalanced sub-tree of the tree data structure reaches a threshold level greater than one (§4), the rebalancing further comprising creating first set of rebalancing operation tasks, the first set of rebalancing operation tasks being characterized by navigation of the tree data structure using at least an existing link (§4, “Split”), creating a second set of rebalancing operation tasks, the second set of rebalancing operation tasks being different from the first set of rebalancing operation tasks and being characterized by location of elements within the tree data structure using at least one pointer created by the first set of rebalancing operation tasks (§4, “Compress”), and performing at least one operation task of the first set of rebalancing operation tasks in a first phase and at least one of the second set of rebalancing operation tasks in a second phase (§5).

23. As per claim 18, Larsen teaches the invention as claimed, including a method of deferring the rebalancing of a tree data structure (§1) comprising the steps of:



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- (a) tracking the performance of operations upon the tree data structure (§§1, 3); and
- (b) rebalancing the tree data structure when an unbalanced sub-tree of the tree data structure reaches a threshold level greater than one (§4), the rebalancing further comprising executing simultaneous rebalancing operations on the tree data structure (§4, “Split”) including performing any first phase operation task of each of the simultaneous rebalancing operations in a first phase using parallel processes (§5), developing a set of serial rebalancing operations during the first phase (§4, “Split”), and performing any second phase operation task of each of the simultaneous rebalancing operations a second phase (§4, “Compress”), the second phase operation task having at least one of the set of serial rebalancing operations (§5).

### *Conclusion*

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (571) 272-3769. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Meng-Ai T An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Syed Ali  
March 16, 2005



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